

IX.—*Asteroidea dredged in the Faeröe Channel during the Cruise of H.M.S. "Triton" in August 1882.* By W. PERCY SLADEN, F.L.S., F.G.S.
Communicated by JOHN MURRAY, F.R.S.E. (Plate XXVI.)

(Read 16th July 1883.)

The star-fishes recorded in the present communication were dredged by Mr JOHN MURRAY during the cruise of H.M.S. "Triton" (under the command of Staff-Commander TIZARD, R.N.), whilst investigating the nature of the Wyville-Thomson Ridge and the adjacent portions of the Faeröe Channel. All the forms, excepting these from Station 3, were obtained from deep water, and the collection, as a whole, is both rich and interesting. One species and two well-marked varieties have not hitherto been described, and two other species have only been found once previously. The series consequently forms a valuable supplement to the collections made during the cruises of H.M.S. "Porcupine" and the "Knight Errant," and is an important addition to our knowledge of the fauna of this region of the Atlantic. I propose to reserve any remarks upon the general character of the asterid fauna of the Faeröe Channel until treating of the collections obtained during the "Porcupine" and "Lightning" cruises.

I am indebted to Mr MURRAY for his kindness in placing this collection in my hands.

I. LIST OF THE SPECIES COLLECTED.

1. *Pteraster militaris* (O. F. Müller), Müller and Troschel.

Station 2. August 5, 1882. Lat. $59^{\circ} 37' 30''$ N., long. $6^{\circ} 49'$ W.

Depth, 530 fathoms; bottom temperature, $46^{\circ} \cdot 2$ Fahr.

2. *Pteraster militaris*, var. *prolata*, nov. (Plate XXVI. fig. 1.)

Station 9. August 23, 1882. Lat. $60^{\circ} 5'$ N., long. $6^{\circ} 21'$ W.

Depth, 608 fathoms; bottom temperature, 30° Fahr.

This is a remarkable form, differing greatly in general appearance from the normal type of *P. militaris*; and although it accords in the main with the diagnostic formula of that species, the majority of the characters differ more or less in degree. It is not improbable that a series of examples might ultimately warrant its being ranked as a distinct species; but for the present I prefer to

place the solitary specimen as a variety of *P. militaris* until further material is available—a course which is sufficient to identify the form, and at the same time indicate the nearest specific affinities.

The variety is characterised by the following points :—The great length and narrowness of the rays ; $R > 3 r$; $R = 58$ to 60 mm., $r = 18$ mm. ; breadth of a ray at the base, 18 to 22 mm. extreme measure. The dorsal paxillæ appear usually to have one of their spinelets much more robust than the two or three companion spinelets, which are remarkably fine and delicate, and the tips of the spinelets can scarcely be said to protrude through the supradorsal membrane, notwithstanding that this latter is placed rather loosely upon them, and much wrinkled. Two or three lineal series of paxillæ are more or less clearly distinguishable along the sides of the rays. On the actinal surface the segmental apertures are remarkably large, and the aperture-papillæ are much broader and more robust at their proximal portion than in *P. militaris*. In the ambulacral spines the three inner spines of each transverse comb form a line oblique to the furrow, the comb being curved aborally at the margin of the furrow, and the position of these spines upon the adambulacral plate being also oblique in relation to the plane of the ray. The actino-lateral spines are very short, and the outer portion of the web which proceeds from the outermost ambulacral spine, *i.e.*, the membranous continuation of the transverse comb upon the actinal membrane, is much more prominent than in the typical form of the species, and extends up to the margin of the lateral fringe. Although these differences may appear insignificant verbally, they produce when combined a striking facies, the characters of which can hardly be explained, as being simply the modifications of the normal form consequent on the conditions of a deep water habitat, since the example of *P. militaris* from 530 fathoms (Station 2), recorded above, differs in no way from the normal form.

3. *Archaster tenuispinus* (Düben and Koren), Sars.

Station 9. August 23, 1882. Lat. $60^{\circ} 5' N.$, long. $6^{\circ} 21' W.$

Depth, 608 fathoms ; bottom temperature, 30° Fahr.

4. *Archaster bifrons*, Wyville Thomson.

Station 10. August 24, 1882. Lat. $59^{\circ} 40' N.$, long. $7^{\circ} 21' W.$

Depth, 516 fathoms ; bottom temperature, 46° Fahr.

Station 11. August 28, 1882. Lat. $59^{\circ} 29' N.$, long. $7^{\circ} 13' W.$

Depth, 555 fathoms ; bottom temperature, $45^{\circ} \cdot 5$ Fahr.

5. *Astropecten Andromeda*, Müller and Troschel.

Station 10. August 24, 1882. Lat. $59^{\circ} 40' N.$, long. $7^{\circ} 21' W.$

Depth, 516 fathoms ; bottom temperature, 46° Fahr.

Station 11. August 28, 1882. Lat. $59^{\circ} 29' N.$, long. $7^{\circ} 13' W.$

Depth, 555 fathoms; bottom temperature, $45^{\circ} \cdot 5$ Fahr.

The propriety of retaining this form in the genus *Astropecten* appears to be questionable. I propose to reserve the discussion of the subject until dealing with some allied forms obtained by the "Challenger" expedition.

6. *Luidia ciliaris*, Philippi.

Station 3. August 8, 1882. Lat. $69^{\circ} 39' 30'' N.$, long. $90^{\circ} 6' W.$

Depth, 87 fathoms; bottom temperature, $49^{\circ} \cdot 5$ Fahr.

I consider this form separate from *L. Sarsii*, D. and K. Both species were comprised in Forbes' *L. fragilissima*. I regard *L. Savignyi*, Audouin, distinct from either.

Rhegaster, gen. nov.

Marginal contour subpentagonal; rays slightly produced. Abactinal surface more or less convex, actinal flat. The whole body covered with membrane, beset with crowded spinelets.

Abactinal skeleton composed of irregular plates, crowded and subimbricated in places, which leave small irregularly disposed meshes. The whole skeleton is hidden in a thick membrane, and furnished with a compact covering of small, uniform, crowded spinelets. Papulae small, numerous, isolated, irregularly distributed over the whole area. Infero-marginal plates large, forming the margin of the test. Supero-marginal plates superficially invisible, concealed in the dorsal membrane. Actinal interradiial areas with large subregular plates, hidden by a superficial membrane, with small crowded spinelets.

Adambulacral plates broader than long. Ambulacral spines short and thickly invested with membrane, forming a regular furrow-series and several subregular longitudinal rows externally. Ambulacral sucker-feet in simple pairs, with small sucker-disk.

Madreporiform body small, midway between margin and apex. Anus subcentral. No pedicellariae.

This genus comes within the scope of the family *Asterinidae* as defined by Dr VIGUIER, and appears to be well distinguished from the other genera of the group. In addition to the species now described, I include in the genus the interesting form named by Dr STUXBERG* *Solaster tumidus*, but which has more recently been referred to the genus *Asterina* by Drs DANIELSEN and KOREN.† The latter naturalists have given an admirable description, and two detail

* *Öfversigt af Kongl. Vet.-Akad. Förhandl.*, Årg. 35, 1878 (1879), No. 3, p. 31, pl. vi.

† *Nyt Mag. f. Naturvidensk.*, Bd. xxvi. hft. 2, p. 182, pls. i. and ii. figs. 6-10.

figures of specimens dredged during the Norwegian North Atlantic Expedition, and a well-marked variety (var. *tuberculata*, D. and K.) is also defined. DANIELSSEN and KOREN state that they place the *S. tumidus* provisionally as an *Asterina*, and mention at the same time a number of important points wherein the form differs from that genus. The determination appears to have been published with cautious hesitation, and I feel bound to express regret that the circumstance of the discovery of the new species should force upon me the undesired course of forestalling the Norwegian savants in the establishment of a genus for the reception of a form upon which they have bestowed such careful study.

Through the kindness of Professor LOVÉN, I had the privilege of examining Dr STUXBERG's type specimens when in Stockholm last autumn, and I am able to confirm the opinion of Drs DANIELSSEN and KOREN in regarding the original reference of the form to *Solaster* as altogether untenable.

7. *Rhegaster Murrayi*, n. sp. (Plate XXVI. figs. 2-7.)

Station 5. August 10, 1882. Lat. $60^{\circ} 11'$ to $60^{\circ} 20'$ N., long. $8^{\circ} 15'$ to $8^{\circ} 8'$ W.

Depth, 433 to 285 fathoms; bottom temperature, $43^{\circ} \cdot 5$ to $40^{\circ} \cdot 8$ Fahr.

Marginal contour subpentagonal, rays slightly produced; the lesser radius in the proportion of 77 per cent., or as 5:6·5. $R=14\cdot3$ mm., $r=11$ mm.

Interbrachial angles somewhat indented at the median interrarial line, from whence the contour curves outward faintly, consequent on a slightly tumid swelling at the base of the ray, and is then gracefully incurved towards the tip, which is obtuse and rounded. Abactinal area high and convex over the disk, sloping down regularly to the extremity of the rays, the height at the centre of the disk being 11·75 mm. A feeble sulcus or depression is present on the outer part of the median interrarial line, which emphasises the tumid character of the base of the rays. Actinal surface more or less flat, excepting that the rays are slightly turned up at their extremity, and that a rather sharp depression occurs in the interbrachial areas along the inner part of the median interrarial line, behind the mouth-plates.

Dorsal area covered with short, delicate spinelets, all of uniform length and size, their lower portion being apparently sunken in membrane. The spinelets stand perpendicular and are closely placed, presenting to the naked eye the appearance of a fine and uniformly granular surface. When magnified the spines are seen to be slightly expanded or flaring outwardly, and to be composed of many rods or lamellæ, with the extremity of each individual lamella terminating in a short thorn-like point.

The spinous dorsal area is punctured with numerous small but conspicuous pores, which are irregularly distributed at small but unequal distances apart over the whole area, excepting the extremities of the rays and a narrow band along the median interradiial line; towards the margin the apertures are smaller, wider apart, and less frequent. Through these apertures the papulae are protruded, and under magnification a small but definite circlet of the dorsal membrane surrounding the puncture of the papula, and unencroached upon by spinelets, may be seen. No grouping of the dorsal spinelets occurs, which in any way indicates the outlines of the underlying plates of the abactinal floor; and the only break in this perfectly uniform covering consists of a number of most minute channel-lines, which run irregularly here and there amongst the spinelets, the only one of these maintained with any regularity being a long straight channel, similar in breadth to all the others, extending along the median interradiial line. The anal aperture is subcentral and distinct, and is surrounded by slightly larger spinelets. The madreporiform body is very small, round, and with numerous striae. It is situated rather nearer to the margin than midway to the centre of the disk, and the surrounding portion of the test is slightly prominent.

Actinal interradiial areas extensive, and with their outer margin conspicuously festooned by the infero-marginal plates. Infero-marginal plates eight to nine in number from the interbrachial line to the tip of the ray; the contour of their outer margin is rounded, and bears a group of eight to twelve spinelets, rather larger and more robust than those of the dorsal area above described. The plates are entirely covered with spinelets—the part which falls in the side of the ray with spinelets similar to those on the dorsal area, and the ventral portion with spines similar to those on the ventral area. When the starfish is viewed in profile, the marginal plates are seen to be clearly marked out by vertical furrows as well as by their prominent tumidity; but the junction of the infero-marginal with the supero-marginal plates, or indeed the presence of these latter at all, is indiscernible to superficial observation. Seen on the actinal side, the marginal plates are clearly defined by well-marked channels or furrows, and these run in oblique lines from the margin up to the adambulacral plates. The furrows are almost regularly parallel, hence the areas or columns they define are of nearly uniform breadth throughout. Consequent on their diagonal direction, a triangular space occurs in the median interbrachial line in the inner portion of the area, which is not conformable to the arrangement above described, the channels which traverse it converging towards the apex of the triangular space, a short distance removed from the margin of the disk. The whole ventral area is covered with small, almost spicular, spinelets, which are short, sharply pointed, and with their bases buried in membrane. The spinelets are all nearly uniform

in size, rather widely spaced, and are directed outward, almost horizontally, the angle at which they stand to the actinal surface being very small.

Ambulacral furrows narrow and almost uniform in breadth throughout. Adambulacral plates broader than long, bearing from five to eight spines. The ambulacral spines form a regular inner or furrow series, which arches over and almost conceals the ambulacral sucker-feet, and three sub-regular outer rows more or less clearly defined. The following is the arrangement of the spinelets on the plates:—Of the inner or furrow series there are two on each plate, which stand side by side and slightly oblique, especially towards the end of the ray. These two spines are regular throughout the ray, and are of equal size, short, compressed, lanceolate, tapering to a sharp point, and invested in membrane, which adds to the apparent breadth of their base. The outer spines are subject to a considerable amount of variation, both in number and position. Three only may be present, each placed behind the other, external to the furrow spines, forming a transverse series on the adambulacral plate, or one, two, or even all three of these spines may be reduplicated—the companion spine usually standing rather oblique. These variations do not appear to be dependent on position in the ray, but may occur in any part. All the outer spines are of uniform size, cylindro-conical in shape, rather obtusely pointed, and covered with membrane.

Mouth-plates form a triangular mouth-angle, not prominent or protuberant superficially, and perfectly conformable with the triangular outline of the inter-radial area. The mouth-aperture is completely closed, and the arrangement of the armature of the mouth-plate is suggestive of that in certain *Goniasteridæ*. The mouth-spines are short, robust, and stand perpendicular. One odd spine is placed at the extreme angle, at the junction of the two plates of a mouth-angle, and five similar spines, all closely placed, occupy the free or furrow margin of the plate, decreasing in size as they recede from the mouth; the odd spine being the largest, the next three slightly smaller, and the two outer ones much smaller. All the spines are cylindrical, slightly taper, and obtusely rounded at the tip. Upon the surface of the plates, and on a line with the two small outer mouth-spines, stand two short secondary or superficial mouth-spines, one on each plate, very robust at the base, conical and pointed; and, further outward again, a second, but much smaller, spine behind each of the secondary mouth-spines; this small pair perhaps belonging to the adambulacral plate adjacent to the mouth-plates. A single minute spinelet, situate on the median or sutural line of the mouth-plates, stands midway between each of the pairs of secondary mouth-spines; and no other spines of any description are present on the mouth-plates.

Remarks.—The form above described is nearly allied to *Rhegaster tumidus* (Stuxberg, sp.). The following appear to be the chief points of difference:—

The length of the ray is much less in the new species, the radial proportions being for *R. Murrayi*, $R=1.3r$, and for *R. tumidus* $R=1.9r$, in specimens of the same size. The rays are consequently much less defined, and are more widely expanded at the base. In *R. Murrayi* the marginal contour is distinctly festooned by the infero-marginal plates, and each of these bears a group of enlarged spinelets, neither of the characters being present in *R. tumidus*. The ambulacral spines appear to be more numerous in the new form, the armature of the mouth-plates somewhat different, the distribution of papulæ more numerous on the dorsal surface, and the character of the spinelets, both on the abactinal and actinal areas, more simple.

I have great pleasure in associating this interesting species with the name of Mr JOHN MURRAY, whose zealous labours in connection with deep-sea dredging are well known.

8. *Mimaster Tizardi*, Sladen.

Station 10. August 24, 1882. Lat. $59^{\circ} 40' N.$, long. $7^{\circ} 21' W.$

Depth, 516 fathoms; bottom temperature, 46° Fahr.

Station 11. August 28, 1882. Lat. $59^{\circ} 29' N.$, long. $7^{\circ} 13' W.$

Depth, 555 fathoms; bottom temperature, $45^{\circ}.5$ Fahr.

9. *Hippasteria plana* (Linck), Gray.

Station 3. August 8, 1882. Lat. $60^{\circ} 39' 30'' N.$, long. $9^{\circ} 6' W.$

Depth, 87 fathoms; bottom temperature, $49^{\circ}.5$ Fahr.

10. *Cribrella oculata* (Linck), Forbes. (Plate XXVI. fig. 8.)

Station 1. August 4, 1882. Lat. $59^{\circ} 51' 30'' N.$, long. $6^{\circ} 21' W.$

Depth, 240 fathoms; bottom temperature, $47^{\circ}.6$ Fahr.

Station 10. August 24, 1882. Lat. $59^{\circ} 40' N.$, long. $7^{\circ} 21' W.$

Depth, 516 fathoms; bottom temperature, 46° Fahr.

Station 11. August 28, 1882. Lat. $59^{\circ} 29' N.$, long. $7^{\circ} 13' W.$

Depth, 555 fathoms; bottom temperature, $45^{\circ}.5$ Fahr.

The specimens from Stations 10 and 11 have an abnormal appearance, even for this variable species, probably consequent on their deep-water habitat. The variation is characterised by the comparative smallness of the disk and the greater length and narrowness of the rays, which are subcylindrical and almost uniform in breadth throughout, especially in the small examples where the expansion at the base is very slight. The single example from Station 11 measures $R=39$ mm., $r=5$ mm., breadth of ray at the base 5.75 mm. The spinelets of the abactinal area are very small, and rather more widely spaced than in the normal form. They are conically pointed, and have the appearance

of being rooted in membrane and rather thickly invested at their base, which gives the spine-groups a larger and somewhat more expanded character than usual in shallow water specimens. The three examples from Station 10 are much smaller, and their spinulation is very minute and scanty, seldom more than two to four spinelets being present in a group. The effect of this is perhaps most striking in the armature of the adambulacral plates, where the group of spines external to the furrow-series becomes abnormally small and insignificant. The comparative length of the ray and its almost uniform breadth is very conspicuous in comparison with small specimens of similar size of the ordinary form, in which the ray is proportionally shorter in the young stage than in the adult. The colour in alcohol of the specimens under notice is a dirty greyish-brown.

Considering the known variability of the species, I do not at present feel justified in doing more than placing on record the character of the variation above noted. If a larger supply of material should ultimately necessitate the nominal recognition of this form as a deep-sea variety, it might appropriately be called *cylindrella*.

11. *Zoroaster fulgens*, Wyville Thomson. (Plate XXVI. figs. 9-11.)

(*Zoroaster fulgens*, Wyv. Thoms. (1873), *The Depths of the Sea*, p. 154, fig. 26.)

Station 11. August 28, 1882. Lat. $59^{\circ} 29' N.$, long. $7^{\circ} 13' W.$

Depth, 555 fathoms; bottom temperature, $45^{\circ} \cdot 5$ Fahr. A young example.

Station 13. August 31, 1882. Lat. $59^{\circ} 51' 2'' N.$, long. $8^{\circ} 18' W.$

Depth, 570 fathoms; bottom temperature, $45^{\circ} \cdot 7$ Fahr.

A brief description and a woodcut of this handsome starfish were given by Sir WYVILLE THOMSON in the work cited above. As no detailed description of the species has yet been published, the following may not be unacceptable:—

Rays five. $R=125$ to 130 mm.; $r=14$ to 15 mm.

Rays very long, narrow, subcylindrical, and tapering throughout to a finely pointed extremity; arched on the abactinal surface, and tumid on the actinal surface on either side of the furrow, which is deeply sunken. Interbranchial angles acute. Breadth of a ray at the base 17 mm.

The disk is rather higher than the rays and slightly tumid. The calcareous skeleton of the whole test is formed of suboval or subhexagonal plates, disposed in perfectly regular longitudinal and transverse series. The following is the arrangement they present. Surrounding a dorso-central and five small radially placed plates are five large plates interradiar in position; and outside and alternating with these are five similar but rather smaller radially placed plates.*

* It will be noted that these plates represent in a remarkable manner the dorso-central, the under basals, the basals, and the radials respectively of the crinoid calyx.

Outward from each of the radial plates proceeds a longitudinal series of plates which extends along the median dorsal line of the ray, each plate regular in form (subhexagonal) and touching or slightly imbricating upon its next serial companion. On either side of this median line of plates is a parallel line of smaller plates, and these are succeeded by a line or series of plates nearly equal in size to those of the median line; the outer of these lines of plates standing on the rounding which separates the dorsal and lateral areas of the ray. Between this dorso-lateral line and the adambulacral plates are five longitudinal and parallel series of plates, the three upper rows forming the sides of the ray and the two lower being on the tumid actinal surface. The plates of the two upper rows of the lateral series are broader than those in the three lower series. The longitudinal arrangement of all the series is perfectly regular, and the plates diminish gradually in size as they proceed outward. Excepting the median dorsal line, the plates of all the other rows form regular transverse series, as well as longitudinal. The plates of the median dorsal line are slightly larger than the others, and consequently do not correspond. All the plates are contiguous, but leave a small diamond-shaped or sub-circular mesh between the rounded corners of adjoining plates. This is covered with membrane, through which one or more small papulæ proceed, and on which are usually borne one, or occasionally two, small forficiform pedicellariæ. The meshes form perfectly regular longitudinal lines, and this character, as well as their presence, is rendered more conspicuous by the slightly tumid surface of the plates. The surface of all the plates is studded with a number of small, uniform, well-spaced miliary granules, on which are articulated very short ciliary spinelets thinly covered with membrane. The plates of the median dorsal line are sub-mammillated, rising to a small but definite tubercle in the middle, which gives attachment to a short, robust, conical spinelet, the surrounding portions of the plate being covered with the same small miliary granules and spinelets as the other plates. Isolated dorso-lateral plates are occasionally similarly mammillated and spined, and the large interradiial plates on the disk are also usually thus furnished. On the plates of the three rows which succeed the adambulacral plates, there are usually one to three spinelets much longer and more robust than the accompanying miliary spinelets. These are naked, delicate, cylindrical, and taper to a fine extremity, and are generally arranged in slightly oblique lines, with the middle spine often more forward and longest when three are present, near the lower margin of the plate, and they are directed upward and appressed to the ray. The next row on the sides of the ray, *i.e.*, the fourth from the adambulacral plates, has one larger spine on each plate, of equal size to the afore-mentioned. The adambulacral plates are quite within the furrow, and are short but broad, extending far upward almost vertically. Each alternate plate is developed into a thin prominent ridge,

which extends far into the furrow and entirely separates neighbouring suckers, whilst the intermediate plates are smooth, and appear to form the true furrow-wall. Four ambulacral spines, which are moderately long, cylindrical, and slightly tapering, are placed in single file at intervals along the edge of the ridge, the innermost being usually the most delicate, and the outermost is usually the shortest. Two to five small forciform pedicellariæ are attached by membrane to the extremity of the delicate innermost spine. One or two small ciliary spines may be present on the extreme outer edge of the adambulacral plate, adjacent to the first row of longitudinal plates; and two or three similar small spines are present in the same position at the outer edge of the non-prominent intermediate plates, but no spines whatever are present on the surface of these plates within the furrow.

The actinostome is deeply depressed, and the mouth-plates are entirely within the cavity, and are not apposable. They are armed only with pointed, moderately robust spines similar to the larger spines on the ridges of the adambulacral plates.

The madreporiform body is small and inconspicuous, and is placed external to one of the interradiial plates.

The anal aperture is small, distinct, surrounded by a circlet of small ciliary spines, and is placed at the side of the dorso-central plate, and consequently slightly excentric in position.

The ambulacral sucker-feet form four rows. They are rather small, sub-conical, and terminated with a small but distinct fleshy sucker.

Premature Phase.—The young form, measuring $R=11$ mm. and $r=2.25$ mm., has a very remarkable appearance, owing to the prominence and distinctness of the component plates of the skeleton. The disk is much higher than in the adult. The dorso-central plate is prominent, and assumes the shape of a rounded cone. The interradiial and first radial plates are of nearly equal size, and are very tumid or almost semi-globular in form. The plates of the median dorsal line are large and distinct, occupying a large portion of the abactinal surface of the ray. The so-called dorso-lateral series of plates form the margin of the ray, and the intermediate plates are small. Between the "dorso-lateral" series and the adambulacral plates there are not more than two fully-developed longitudinal rows of plates, with a partially-developed series commencing to appear between the latter and the adambulacral plates. The terminal (ocular) plates are very large, somewhat resembling the shape of a serpent's head, and are armed with one or two pairs of comparatively large robust spinelets, near the extremity, which are directed outwards.

The large plates of the disk and the median dorsal line have already a small tubercle, but only some of these bear spinelets. All the plates have a few widely spaced and very minute granules and microscopic ciliary spinelets. The

spinelets on the lower rows of plates are comparatively long and well developed. The character of the alternate prominent adambulacral plates is already discernible, although not more than one or two ambulacral spinelets are present on each.

The madreporiform body is outside and external to the interradial plate, and almost in the ravine of the interbrachial angle. The anal aperture is excentral, and situated between the dorso-central plate and an interradial plate, standing in the right posterior interradius when the madreporiform body is placed in the right anterior interradius.

12. *Asterias Mülleri*, Sars.

Station 5. August 10, 1882. Lat. $60^{\circ} 11'$ to $60^{\circ} 20'$ N., long. $8^{\circ} 15'$ to $8^{\circ} 8'$ W.

Depth, 433 to 285 fathoms; bottom temperature, $43^{\circ} \cdot 5$ to $40^{\circ} \cdot 8$ Fahr.

II. STATION-LISTS.

The following lists show the species associated at the respective stations:—

Station 1. August 4, 1882. Lat. $59^{\circ} 51' 30''$ N., long. $6^{\circ} 21'$ W.

Depth, 240 fathoms; bottom temperature, $47^{\circ} \cdot 6$ Fahr.

Cribrella oculata.

Station 2. August 5, 1882. Lat. $59^{\circ} 37' 30''$ N., long. $6^{\circ} 49'$ W.

Depth, 530 fathoms; bottom temperature, $46^{\circ} \cdot 2$ Fahr.

Pteraster militaris.

Station 3. August 8, 1882. Lat. $60^{\circ} 39' 30''$ N., long. $9^{\circ} 6''$ W.

Depth, 87 fathoms; bottom temperature, $49^{\circ} \cdot 5$ Fahr.

Hippasteria plana.

Luidia ciliaris.

Station 5. August 10, 1882. Lat. $60^{\circ} 11'$ to $60^{\circ} 20'$ N., long. $8^{\circ} 15'$ to $8^{\circ} 8'$ W.

Depth, 433 to 285 fathoms; bottom temperature, $43^{\circ} \cdot 5$ to $40^{\circ} \cdot 8$ Fahr.

Rhegaster Murrayi.

Asterias Mülleri.

Station 9. August 23, 1882. Lat. $60^{\circ} 5'$ N., long. $6^{\circ} 21'$ W.

Depth, 608 fathoms; bottom temperature, 30° Fahr.

Pteraster militaris var. *prolata*.

Archaster tenuispinus.

Station 10. August 24, 1882. Lat. $59^{\circ} 40' N.$, long. $7^{\circ} 21' W.$
Depth, 516 fathoms ; bottom temperature, 46° Fahr.

Archaster bifrons.

Astropecten Andromeda.

Mimaster Tizardi.

Cribrella oculata var. *cylindrella.*

Station 11. August 28, 1882. Lat. $59^{\circ} 29' N.$, long. $7^{\circ} 13' W.$
Depth, 555 fathoms ; bottom temperature, $45^{\circ} \cdot 5$ Fahr.

Archaster bifrons.

Astropecten Andromeda.

Mimaster Tizardi.

Cribrella oculata var. *cylindrella.*

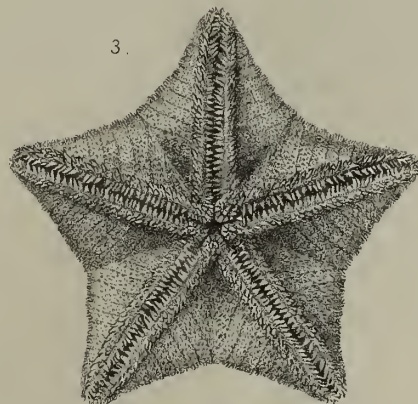
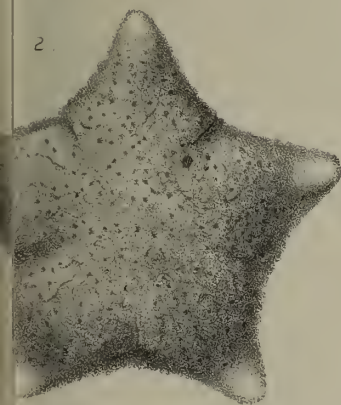
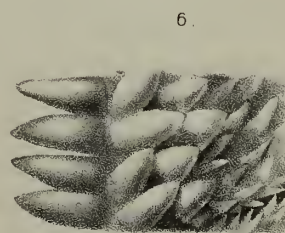
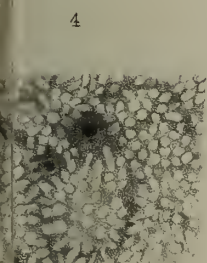
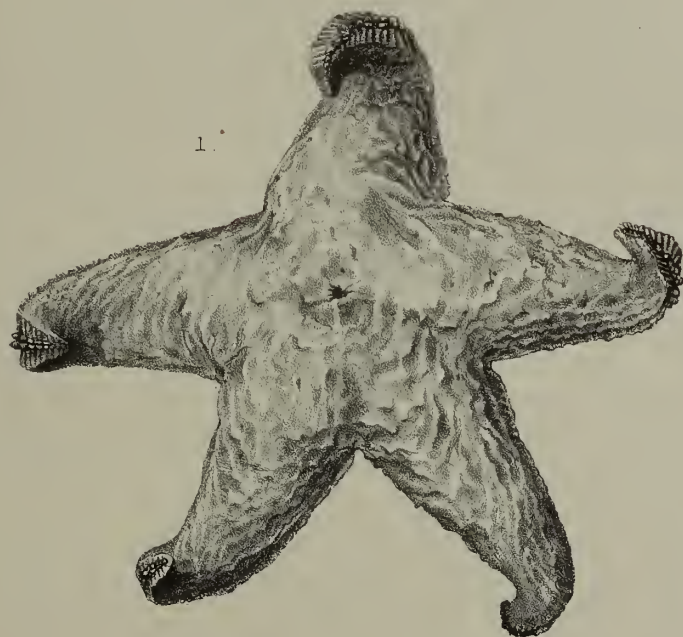
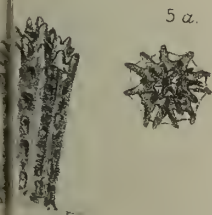
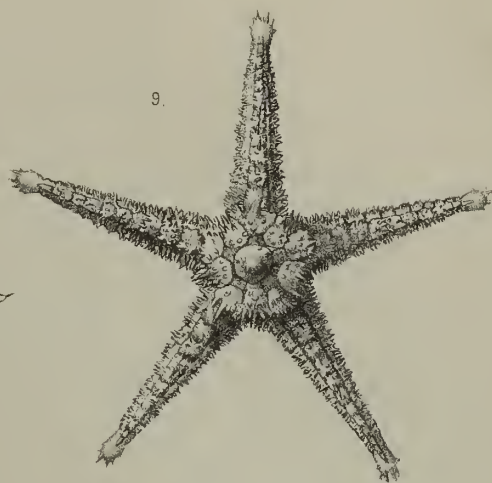
Zoroaster fulgens.

Station 13. August 31, 1882. Lat. $59^{\circ} 51' 2'' N.$, long. $8^{\circ} 18' W.$
Depth, 570 fathoms ; bottom temperature, $45^{\circ} \cdot 7$ Fahr.

Zoroaster fulgens.

DESCRIPTION OF PLATE XXVI.

- Fig. 1. *Pteraster militaris* var. *prolata.* Abactinal aspect ; natural size.
Fig. 2. *Rhegaster Murrayi.* Abactinal aspect ; magnified 2 diameters.
Fig. 3. " Actinal aspect ; magnified 2 diameters.
Fig. 4. " Portion of the dorsal surface ; magnified 20 diameters.
Fig. 5. " One of the spines of the dorsal surface, seen in profile ; highly magnified.
Fig. 5a. " The same spine seen from above ; highly magnified.
Fig. 6. " Adambulacral plates and portion of the adjacent ventral surface ; magnified 8 diameters.
Fig. 7. " Mouth-plates ; magnified 10 diameters.
Fig. 8. *Cribrella oculata* var. *cylindrella.* Abactinal aspect ; natural size.
Fig. 9. *Zoroaster fulgens.* A young example. Abactinal aspect ; magnified 3 diameters.
Fig. 10. " Outline of the profile of the same specimen.
Fig. 11. " Diagram of the plates of the disk, showing their correspondence with the crinoid calyx. The respective plates are marked as follows :—
1. Dorso-central.
2. Under Basals.
3. Basals.
4. Radials.



1. *PTERASTER MILITARIS*, var. *PROLATA*.
8. *GRIBRELLA OCULATA*, var. *CYLINDRELLA*.

2-7. *RHEGASTER MURRAYI*.
9-11. *ZOROASTER FULGENS*.

